Curriculum Vitae

Nicholas D. Deardorff, Ph.D

Associate Professor
Indiana University of Pennsylvania
Department of GeoSciences

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Education

2011 **Doctor of Philosophy -** Geology, University of Oregon, Eugene, OR. Dissertation: "Eruptive Processes of Mafic Arc Volcanoes- Subaerial and Submarine Perspectives" (advisor: Kathy Cashman)

2003 **Bachelor of Science -** Marine Science and Geology (with Honors in Geology), University of Miami, Coral Gables, FL. Honors Thesis: "Volatiles in Indian Ocean Mid-Ocean Ridge Basaltic Glasses: Contamination of the Indian Ocean Mantle by Hydrated or Dehydrated Crustal Components." (advisor: Jackie Dixon)

Appointments

2018-present **Associate Professor**, Indiana University of Pennsylvania
2013-2018 **Assistant Professor**, Indiana University of Pennsylvania
2012-2013 **Assistant Professor**, University of Minnesota, Duluth, MN
2011-2012 **Assistant Professor**, University of Minnesota, Morris, MN
2005-2011 **Graduate Teaching Fellow**, University of Oregon, Eugene, OR

Awards and Honors

2008 Staples Fellowship, Dept. of Geological Sciences, University of Oregon
2007 Good Citizen Award, Dept. of Geological Sciences, University of Oregon
2006 Staples Fellowship, Dept. of Geological Sciences, University of Oregon

Grants Funded

2018 NSF MRI, $425,829- MRI: Acquisition of a Scanning Electron Microscope with EDS and EBSD Capabilities to Enhance Teaching and Research at Indiana University of Pennsylvania

2018 NSF ICER, $33,576- Building an Inclusive Geology Field Camp for the PASSHE: Workshop Proposal: Pittsburg, PA - January 3-4, 2019

2017 IUP University Senate Research Committee Award, $2,000- Timescales of microcrystallization during recycling of basaltic tephra determined through reheating experiments

2017 IUP University Senate Research Committee Award, $1,000- Determining the effect of composition on timescales and extent of crystallization in recycled tephra through heating experiments: Presentation at the IAVCEI Conference 2017 (Portland, OR Aug. 13-19)

2016 IUP University Senate Research Committee Award, $2,000- Remote characterization of lava flow surface folds using discrete Fourier Transform analyses.

2014 PASSHE Faculty Professional Development Committee, $9,975- Lidar and Field Investigation of Lava Flow Textures in Central Oregon

2014 IUP University Senate Research Committee Award, $1,000- Remote characterization of dominant wavelengths of surface folds on lava flows using

	Lidar and Discrete Fourier Transform analyses: Presentation at the AGU Fall Meeting 2014 (San Francisco, CA Dec. 14-19)
2012	Grand-In-Aid, University of Minnesota, Duluth ($33,438- award was declined due to accepting position at Indiana Univ. of PA)
2008	USGS, Kleinman Volcano Research Grant
2006	National Center for Airborne Laser Mapping, NSF funded Seed Grant for Airborne Laser Swath Mapping

Professional Development

2014	Cutting Edge Early Career Geoscience Faculty Workshop- Covered efficient and effective teaching practices, developing a thriving research program, getting tenure, and life/work balance(June 22-26, University of Maryland, College Park, MD)
2014	*DeSSC (Deep Submergence Science Committee) New User Program*- workshop introduced the UNOLS deep submergence assets and submersibles used in marine research and focused on steps and tips on how to get funding to use these assets. (Dec. 13-14, 2014 San Francisco, CA)

Publications (Students underlined)

Manuscripts in preparation

Barber, M., **Deardorff, N**., Using Lidar reflective intensities to characterized lava flow surface morphologies

Published

Deardorff, N., Booth, A., Cashman, K., 2019. Remote characterization of dominant wavelengths from surface folding on lava flows using Lidar and Discrete Fourier Transform analyses. *Geochemistry, Geophysics, Geosystems*. DOI: 10.1029/2019GC008497.

Deardorff, N., Branan, Y., Lewis, J., Tindall, S., Straffin, E., Hovan, S., 2019. Consensus from Workshop: Building an Inclusive Geology Field Camp for the Pennsylvania State System of Higher Education (Jan. 3-4, 2019)-White Paper. March 8, 2019.

Deardorff, N., Cashman, K., 2017. Rapid crystallization during recycling of basaltic andesite tephra: timescales determined by reheating experiments." *Scientific Reports* 7
DOI: 10.1038/srep46364

Schnur, S., Chadwick, W., Embley, R., Ferrini, V., de Ronde, C., Cashman, K., **Deardorff, N.**, Merle, S., Dziak, R., Haxel, J., Matsumoto, H., 2017. A decade of volcanic construction and destruction at the summit of NW Rota-1 seamount: 2004–2014." *Journal of Geophysical Research: Solid Earth* 122.3: 1558-1584.

Cashman KV, Soule SA, Mackey BH, Deligne NI, **Deardorff** ND, Dietterich HR, 2013. How Lava Flows: New Insights from Applications of Lidar Technologies to Lava Flow Studies. Geosphere. Vol. 9: 6.

Deardorff, N., Cashman, K., 2012. Emplacement conditions of the c.1600 year-BP Collier Cone lava flow, Oregon: a LIDAR investigation. Bull. Volcan. Vol. 74: 9, p. 2051-206 DOI: 10.1007/s00445-012-0650-9

Deardorff, N., Cashman, K., Chadwick, W., 2011. Observations of eruptive plume and pyroclastic deposits from submarine explosive eruptions at NW Rota-1, Mariana Arc, J. Volcanol. Geotherm. Res. Vol. 202, p. 47-59. doi:10.1016/j.jvolgeores.2011.01.003

Chadwick, Jr., W. W., Cashman, K. V., Embley, R. W., Matsumoto, H., Dziak, R. P., de Ronde, C. E. J., Lau, T. K., **Deardorff**, N. D., Merle, S. G., 2008. Direct video and hydrophone observations of submarine explosive eruptions at NW Rota-1 volcano, Mariana arc, J. Geophys. Res., 113, B08S10, doi:10.1029/2007JB005215.

Published Abstracts (Students underlined)

Cromwell, C., **Deardorff, N.**, Grain-size and Componentry Analysis of Multiple Vents in 2010 from Submarine Volcano NW Rota-1, Mariana Arc. Abstract No: 376637 presented at 2018 AGU Annual Meeting, Washington D.C., 14 Dec.

Patch, A., **Deardorff, N.**, Determining crystallization dynamics of recycled tephra thorugh reheating experiments under NaCl solution. Abstract No: 308159 presented at 2017 GSA Annual Meeting, Seattle, WA, 25 Oct.

Deardorff, N., Patch A., Humbert, C., Golus, D., Determining the effect of composition on timescales and extent of crystallization in recycled tephra through heating experiments. Abstract No: ME43B-013 presented at 2017 IAVCEI Meeting, Portland, OR, 17 Aug.

Barber, M., **Deardorff, N.**, Characterization of volcanic terrains using lidar return amplitudes and other data: a statistical approach. Abstract No: FT21A-3 presented at 2017 IAVCEI Meeting, Portland, OR, 15 Aug.

Golus, D., **Deardorff, N.**, Recrystallization of basaltic tephra through reheating experiments. Abstract No: 290462 presented at 2017 GSA Northeaster North-Central Joint Section Meeting, Pittsburgh, PA, 19 Mar.

Humbert, C., **Deardorff, N.**, Experimental crystallization of basaltic tephra under the influence of NaCl: an analog for recycling in the submarine environment. Abstract No: 290840 presented at 2017 GSA Northeaster North-Central Joint Section Meeting, Pittsburgh, PA, 19 Mar.

Deardorff, N., Soule, A., Lava block size measurements using 3D point clouds derived from 2D photos and Structure-From-Motion. Abstract No: 259168 presented at 2015 Fall Meeting, GSA, Baltimore, MD, 4 Nov.

Barber, M., **Deardorff, N**., Mapping Mokst Butte Lava Flow in Central Oregon Using Lidar Reflective Intensity Data and Field Observations. Abstract No: 258308 presented at 2015 Fall Meeting, GSA, Baltimore, MD, 3 Nov.

Deardorff, N., K. Cashman. 2014 Remote characterization of dominant wavelengths of surface folds on lava flows using Lidar and Discrete Fourier Transform analyses. Abstract V13C-4801 presented at AGU Fall Meeting, San Francisco, Calif., 15 Dec.

Deardorff, N., Cashman, K., 2012 Recycling and reheating of pyroclasts as possible mechanism for increased groundmass crystallization in basaltic tephra. Abstract V51E-05 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 7 Dec.

Deardorff, N., Cashman, K., 2010 Post-eruptive magma mixing: recycling in volcanic vents. Abstract V43C-2391 presented at AGU Fall Meeting, San Francisco, Calif. 16 Dec., 2010.

Deardorff, N., Cashman, K., Chadwick, W., 2009 Anomalous Chlorine Concentrations Indicate Recycling of Submarine Pyroclasts at NW Rota-1, Mariana Arc. Eos, AGU Vol. 90, No. 52, Fall Meet. Suppl., Abstract V44B-04.

Deardorff, N., Cashman, K., 2009 Morphologic Measurements on an Intermediate Composition Blocky Lava Flow Field in Central Oregon Using High Resolution (~1m) Lidar DEMs- a Technical Approach, Geological Society of America *Abstracts with Programs*, Vol. 41, No. 7, p. 432.

Deardorff, N., Cashman, K., 2008 Morphologic Measurements on an Intermediate Composition Blocky Lava Flow Field in Central Oregon Using High Resolution (~1m) Lidar Dems, IAVCEI 2008 *Conference Programme* (Abstract) p. 49.

Deardorff, N., Cashman, K., Chadwick, W., Embley, R., 2007 Plume and Pyroclast Dynamics Observed During a Submarine Explosive Eruption at NW Rota-1, Mariana Arc, Eos Trans. AGU, 88(52), Fall Meet. Suppl., Abstract V24B-07.

Deardorff, N., Emerson, L., Soule, A., Belien, I., Gottesfeld, E., Johnson, E., Mckay, D., Wisely, B., 2007 Implementation of Ground-Based Lidar, Total Station, and GPS in an Advanced Geophysical Study of Basaltic Cinder Cone Morphology, Four Craters Volcanic Field, Oregon, Geological Society of America *Abstracts with Programs*, Vol. 39, No. 6, p. 123.

Deardorff, N., Cashman, K., Chadwick, W., Embley, R., 2006 Submarine Explosive Eruptions: Physical Volcanology of NW Rota-1, Marianas, Eos Trans. AGU, 87(52), Fall Meet. Suppl., Abstract V23B-0609.

Invited Presentations

2017 **University of Pittsburgh** - Determining the effect of composition on timescales and extent of crystallization in recycled tephra through heating experiments

2015 **New Mexico State University**- Remote characterization of dominant wavelengths of surface folds on lava flows using Lidar and Discrete Fourier Transform analyses

2013 **University of Minnesota, Duluth**- Emplacement conditions of the c. 1600ybp Collier Cone lava flow, Oregon: a Lidar investigation

2007 **National Association for Geoscience Teachers**, Portland State University, OR - Submarine Volcanoes in the Mariana Arc: Explosive Eruptions, Sulfur Pits, and Macrofauna

Research Cruise Experience

2018 Dec. 3-21, 2018 I participated as an on-shore participant for a research cruise to the **East Pacific Rise along the 9°N mid ocean ridge**. This cruise was a UNOLS Early Career Scientists cruise that worked to professionally develop and introduce deep ocean research to young scientists while collecting scientific data and samples.

2010 **Return to NW Rota-1** (southern Mariana Arc), expedition to observe changes in eruption dynamics, biological and hydrothermal activity, and sample rocks and vent fluids from the active vent with Jason II ROV.

2009 **Return to NW Rota-1** (southern Mariana Arc), observations of eruption dynamics, biological and hydrothermal activity and sampling with Jason II ROV.

2006 Submarine Ring of Fire 2006, NOAA- expedition exploring nine submarine volcanoes along the **Mariana Arc** for hydrothermal, volcanic and biological activity. Collected direct video and hydrophone recordings, and hand samples from **explosive eruptions at NW Rota-1**, with Jason II ROV.

2003 Exploration and mapping of **Endeavor Deep**, located on the Nazca/Juan Fernandez plate boundary. Assisted in collection and sampling of rocks retrieved and video recording by Jason II ROV.

Field Experience

2014-2015 Field mapping, rock sample collection, and ground-based lidar scanning of lava flows in Central Oregon High Cascades

2006-2010 Field mapping and rock sampling of Holocene Collier Cone lava flow field, Oregon High Cascades

2007 IAVCEI workshop in Nevada, Utah, California, entitled *Surtseyan volcanism: shallow subaqueous explosive eruptions*, lead by James White.

2007 GPS, Total Station and Ground-based Lidar mapping and scanning of cinder cone and lava flow morphologies at Four Craters Volcanic Field, Central Oregon

2007 International consortium EHaz field trip, focused on natural hazards: Volcano edifice failure in Cascades and Western Canada

2006 Ground-based Lidar scanning of lava flows in the Oregon High Cascades

Teaching Experience

Courses taught at Indiana University of Pennsylvania

GEOS 101 – **The Dynamic Earth (lecture)**; Fall 2014 (120 students),
GEOS 101 – **The Dynamic Earth online (lecture)**; Winter 2016, May session 2016, 2017 (32-35 students)
GEOS 102 – **The Dynamic Earth Lab**; all sections have 24 student occupancy
GEOS 104 – **Oceans and Atmospheres Lab**; Spring 2017 - all sections have 24 student occupancy
GEOS 156 – **Geology of Natural Disasters**; Fall 2018 - ~65 students
GEOS 201 – **Foundations of Geology** (Lecture and Lab); Lecture-40-70 students, Lab-20-24 students
GEOS 301 – **Mineralogy & Petrology** (includes lab); Fall 2013 (22 students), Fall 2014 (11 students)
GEOS 301 – **Mineralogy** (includes lab); taught each fall (10-24 students)
GEOS 303 – **Field Mapping**; summer 2013 (12 students)
GEOS 311 – **Geochemistry** (includes lab); Spring 2014 (9 students), Spring 2016 (10 students)
GEOS 404 – **Newfoundland Field Workshop**; summer 2016 (12 students)
GEOS 470 – **Research Methods**; Spring 2014, 2017 (22-23 students)
GEOS 481 – **Oregon Geology Field Research Experience**; Summer 2014 (9 students)
GEOS 482 – **Independent Study**; Fall 2014 (2 students)

Courses taught at University of Minnesota, Duluth

Fall 2012	**Mineralogy** (Geol 2311- 30 students)
Spring 2013	**Geology and Earth Systems** (Geol 1110- 150+ students)
Spring 2013	**Submarine Geology** (Geol 5091- 12+ students) Seminar-style course for upper-level undergraduate and graduate majors.

Courses taught at University of Minnesota, Morris

Fall 2011	**Mineralogy & Crystallography** (Geol 2111- 7 students)
Fall 2011	**Physical Geology** (Geol 1101- 30+ students)
Spring 2012	**Igneous and Metamorphic Petrology** (Geol 2111- 7 students)
Spring 2012	**GIS and Remote Sensing** (Geol 2161- ~30 students)

Professional Service (# of reviews since 2013)
NSF Grant Proposal Reviewer – NSF OCE-Marine Geology and Geophysics (1)

Professional journal articles reviewed
- *Geochemistry, Geophysics, Geosystems* (1)
- *Terra Nova* (1)
- *Journal of Volcanology and Geothermal Research* (2)

Analytical/Field Equipment and Software Experience

Microprobe, Scanning Electron Microscope, Fourier Transform Infrared Spectroscopy, X-ray Diffractometry, Trimble GPS, Total Station, Leica Scanstation C5 3D Ground-based Lidar system, ArcGIS, Matlab

Professional Affiliations

American Geophysical Union
Geological Society of America
International Association of Volcanology and Chemistry of the Earth's Interior